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AUTHOR	Bazillion, Richard; Braun, Connie; Matter, Christa; Murphy, J. William; Pevas, Mary Ann; Svingen, Bruce
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ABSTRACT

This paper highlights four World Wide Web-based courses that were developed by faculty members at Winona State University (Minnesota). The courses were in the fields of physical education and recreation, administrative information systems, economics, and chemistry. The faculty members' experiences and student reactions are described. (MES)

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Really Using the Web for Learning and Teaching in Higher Education.

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Really Using the Web for Learning and Teaching in Higher Education

Richard Bazillion, Connie Braun, Christa Matter, J. William Murphy, Mary Ann Pevas, Bruce Svingen
Winona State University

Introduction

Among the many courses now on the Web, there seems to be a great deal of what has been called "shovelware." Textual materials, such as syllabi and lecture notes, have simply been "shoveled" onto Web pages, with little use being made of graphics, hyperlinks or streaming media. When value-added effort is missing, the Web's teaching and learning potential remain untapped or unrealized.

The members of this faculty panel–all from Winona State University in Minnesota–have transcended shovelware to create Web-based courses with considerable value-added. They have adopted the Web as a means of giving students a different kind of educational experience: one that is both dynamic and intellectually rigorous.

Exposure to this new perspective on teaching came in a series of Web Camps offered at Winona State for two-and-a-half years, beginning in 1997. Working with easily accessible development software (FrontPage™ and PaintShop Pro™), faculty applied their own creative energies to new Web-based courses. The Web Camps concentrated on showing faculty how to capitalize on the flexibility of the software in ways designed to promote learning. Training in specific software applications took a back seat to an exploration and application of effective educational principles in a Web-based environment. These principles can be transferred to any development-software package, because they are the common currency of Web-based teaching.

Design and functionality of the course Website should be simple (i.e. conform with the principle of Occam's Razor) Design should be consistent, with common features throughout Interactivity is a paramount consideration The course must be dynamic, i.e. constantly evolving and improving Humor should be included.

The courses showcased and analyzed here respect each of these principles, at least to some degree, and illustrate other important design criteria as well. Especially significant are the built-in assessment tools that provide evidence for the effectiveness (or lack of it) of Web-based teaching.

Clearly the Web is a medium that promises almost limitless opportunities to experiment and to find better ways to promote student learning. If Web-based courses are developed in such a way as to remain dynamic, then innovations can be incorporated as they appear. Perhaps the greatest advantage of Web-based teaching, then, is that it retains its freshness through a process of evolution directed by faculty themselves.

Christa Matter (Physical Education & Recreation)

Really Using the Web for Learning and Teaching in Physical Education

As we enter the new Millennium, technology and education have merged to enhance teaching and learning. More specifically to the field of physical education, "a student may learn the rules of a game, the method of keeping score, and the many do's and don'ts via a computer."1 In an effort to merge technology and education a number of tutorial sessions for faculty to develop Web sites, more commonly referred to as "Web camps", have been offered at Winona State University. Rather than learning about specific software and hardware programs, the "Web camp" utilized easy-to-use programs such as FrontPage and PaintShop Pro to teach the participating faculty to use technology in their respective disciplines. The "Web camp" I participated in prompted me to develop a Web site (http://phil.winona.msus.edu/cmatter) for my physical education activity and theory-based classes at Winona State University.

A common error by a great many educators attempting to merge technology and education is to only use the Web site as a "bulletin board" to post course requirements and the syllabus (also referred to as "shovelware"). Keeping this in mind, I set out to develop a Web site that could not only be used as an informational resource, but could also provide enriching activities for students to learn more about their respective subject matter. My Web site includes individual Web pages for four activity-based physical education courses and three theory-based physical education courses. The pages provide additional information about the courses and subject matter, links to professional organizations as well as various on-line assignments.

My activity class assignments afford students further learning opportunities without the time constraints of a fifty minute class session, where activity should be the primary focus. More specifically, interactive assignments for each activity course have been developed. Additionally, in an effort to reduce the amount of wait time for feedback on assignments, on-line "forms" have been created with a confirmation page to immediately notify the student of their results. Assignments for badminton include searching the Internet to compare the "official" laws of play with "recreational" laws of play, a self-evaluation form in which students evaluate their skills, a court quiz and final exam. Volleyball assignments include a court quiz and final exam along with a self-evaluation of skills, a discussion of the history of volleyball and an observation form to use when attending a home WSU Women's Volleyball match. The racquetball page also contains exams and a court quiz but also includes a form to record the student's play/practice session outside of class. And finally, assignments in weight training include a training log to be submitted weekly, a group assignment defining strength training terminology and a final exam.

The theory-based Web pages provide the student with access to additional information for class discussions as well as assignments and opportunities for more advanced learning of the specific subject matter from the convenience of the student's home. For example, several on-line projects have been developed for my three physical education theory courses. On-line quizzes and exams were prepared (with due dates indicated on the form) which allowed for students to take the test when it was conducive for them. Students electronically submitted abstracts of research articles, which pertained to the Perceptual Motor Development class. Assignments in the Developmental/Adapted Physical Education class include a discussion forum, a project related to physical education and health standards for elementary, middle school and secondary students in the state of Minnesota, and the opportunity to communicate electronically with a professional in the field or to post a question related to Adapted Physical Activity on a national physical education Web site (PE Central).

The opportunity to infuse technology into the delivery of the theory course curriculum is strongly encouraged by WSU's College of Education "Effective Educator Program". The program is a model that links four domains: Knowledge, Skills, Professionalism and Practice to prepare future effective educators. Under the Skill domain of the effective educator program, the student will "use educational technology to meet the goals and objectives of classroom instruction and management."2 Consequently, students are expected to learn and demonstrate several competencies in relation to the tool of technology. The assignments created specifically for the upper level theory courses afforded students the opportunity to apply what they had learned regarding educational technology.

Feedback from the students has reflected a successful integration of technology into the physical education courses I instruct. Through end of course evaluations, students commented positively on the Web site assignments. Some comments reflected further interest in the subject matter as a direct result of completing the specific Web site assignments. For example, when asked to comment on the effectiveness of the activity class Web pages, students offered the following comments:

Easy to use and very helpful
Set up well and gave basic information
I liked how it allowed us to do the assignments off the Web.

It was equally important to gather information from the students regarding their overall impressions of the Web site based activity class. Again, students provided positive feedback in relation to the Web page

assignments and exhibited an overall positive impression of the Web site. Selected student comments included:

I really liked it
It was fun, I enjoyed it-- good technique
It was good because it gave us more time in class to play (volleyball)
Worked out better than handing them (assignments) in
Sending them (assignments) was a great idea--less paperwork to worry about
Learned a lot more skills--thanks.

With the advent of computer assisted instruction, assignments for four activity courses and three physical education theory courses at Winona State University have been greatly enhanced by the technology offered through course Web sites. Besides saving paper, students have the opportunity to continue their inquiry of the subject matter individually as they complete the assignments online. Students have the flexibility to complete assignments or pursue additional links of information provided through resources from the Internet. Because time is not allotted during class sessions to complete written tests or assignments, the activity courses remain entirely activity based where additional time for skill development is provided.

Higher education's fundamental goal of encouraging self-motivated learners may be enhanced by utilizing the technology of a Web site in physical education courses as well as other subjects. "If we consider which factors of computer mediated communication will be most important to education in the information age, it seems our goals should be to develop self-motivated learners and help people learn to find and share information."3 The intent of my Web site is not only to infuse technology into the curriculum but also to encourage students to think critically and work cooperatively and collaboratively with their peers. Ultimately, Web site technology has provided and will continue to provide enriching and extending activities for the students while providing the instructor with less paperwork (although more time spent reading email assignments) and more time to dedicate personalized instruction during the actual class session. As educators, the more we recognize and educate ourselves on the merging technologies in education, the more our student's education will be enhanced in the 21st century.

1. Donnelly, Joseph E. Using microcomputers in physical education and the sport sciences. 1987 Human Kinetics Publishers, INC, Champaign, IL.

2. Effective Educator Program: Winona State University Educator Handbook, Effective September 1998. College of Education, Winona State University, POB 5838, Winona, MN, 55987

3. Berge, Z.L., Collins, M.P. Computer Mediated Communication and the Online Classroom. Volume 1: Overview and Perspectives. 1995. Hampton Press, INC, Cresskill, NJ

J. William (Bill) Murphy (Administrative Info. Systems)

Really Using the Web for Learning and Teaching in Higher Education

In August 1999 I had the opportunity to attend WSU's Web camp which was my first real experience with using Front Page and actually creating web pages. I had experimented with Publisher but didn't get too far. Now I was hooked. I immediately started loading syllabi for my classes. This was just too good to be true. No more mass distribution of hard copy, no more excuses for students not being able to locate their copy of the course syllabus or complete assignments because of misplaced notebooks.

In the two weeks prior to the opening of the fall semester, I created web pages for four courses. As my interest and fascination grew, so did the degree to which I expanded my web pages. I started adding Microsoft PowerPoint slide presentations. I even added a prerecorded message to my personal web page.

On the first day of class, I announced to the students that I had gone high tech! What a mistake! Now there

was no turning back. The students could not believe it one night when I actually used the overhead projector. I was reminded of my "high tech" statement. From then on, the overhead got rolled into a corner and everything I did--from ice breakers to team activities, assignments, outlines, electronic resources, etc.--went up on the web.

What I very quickly discovered was that students at WSU are becoming increasingly computer savvy. The laptop university has challenged our students and faculty to stay up on technology. Students respond positively to the web site and like the idea of being able to check the site for weekly or daily assignments.

While certain elements are still "shovelware" it is what I have done with these that make a difference. For instance, the syllabus is constantly evolving particularly in terms of course schedule and availability of assignments and resources. Students become acclimated to checking the web site for updates and even comment if something has not appeared regularly or in a timely fashion. The ability to eliminate the middle person—I load the computer applications student data disk onto my web site, list the day's assignments or week's assignments, and create the links. The students open the web page, click on the appropriate files, and download to their disks.

My assignments are so much more current because I can locate resources myself or ask the students to find resources. As part of two graduate/under-graduate courses where the grad students have to do extra work as part of the class, I asked the graduate students l to locate ice breakers for training classes and present these at the beginning of class. The graduate student selected the nights to do their ice breakers. Even though a number of books are available, I found the students searching the WWW and bringing in fresh, new ideas. The graduate students also had to locate electronic resources that could be used for various topics or for the course as a whole. These resources were then added to the course syllabus.

One idea that caught on very quickly and worked very well was using discussion forums. In the beginning I posted articles and started the discussion online with a question. About midterm, I gave the graduate students the responsibility for identifying an article, posting it to the forum, and leading the discussion.

The student feedback regarding the discussion forums has convinced me that this will be an integral part of my future classes. Students particularly liked the flexibility of being able to read postings at their leisure. Others thought it was a great way to add value to the class and talk about other topics that otherwise may not be covered or able to be discussed. Other benefits identified by the students included the following:

1.using a form of technology with which I was unfamiliar.
2.relating experiences on many different training topics.
3.transforming my view of other students in the class.
4.reading the sometimes-divergent viewpoints of the class.
5.associating faces with comments.

The student evaluations have been much more positive, I think in part, because what I am trying to do with the web is so much more in line with where students are coming from today as compared to other times in my career. I have gone from the era where students sat in lecture classes and tested with hard copy tests and Scantron sheets to students who were weaned on Atari and Pac Man. Today's students thrive on online research, discussion forums, and interactive computerized tests.

We have a large number of techno savvy students who appreciate the flexibility of the web site. Several non-traditional students attended class only on TTH while my computer application class was MWF. They were able to access the assignments and student files via the www and with my permission only attended class for the tests. Communication outside of class was handled by email. My tests were interactive and computerized, but our capability for delivering the test at that time was limited to on-campus labs.

My personal observations based on using the web last semester include:

1.Email from students increased providing opportunities to interact on a more personal basis that would ordinarily never happen because they may not come into the office.

2.Opportunities to change schedules in a short time—nothing set in stone as on a printed syllabus. Whereas I used to use the term tentative schedule, I now believe dynamic schedule is more accurate.
3.While there is considerably more work at the front end getting web pages designed and operational, the back end is simplified because hard copies are eliminated and forms and responses can be accessed via the web or email.

My future plans for "really using the web" include the following:

1.videotaping student presentations with a digital camcorder, downloading the videos to the web, and having students view and evaluate their oral presentations via their laptops;
2.posting (with appropriate permissions) anonymous examples of student work;
3.incorporating Net Meeting software for team activities;
4.increasing the use of discussion forums; and,
5.developing an internet marketing class in which students will develop web pages or organizations and businesses.

The August Web Camp was one of the highlights of my ten years at Winona State and, in fact, my entire teaching career because it has opened up new avenues for me both as an educator and as a member of professional organizations. Honestly, I believe this was one of the most exciting experiences I can remember because it has equipped me with new skills and options for delivering learning and information to my students and my colleagues both at Winona State and at other institutions.

Mary Ann Pevas (Economics)

Learnings from Using the Web in the Teaching of Economics

As an individual who is naturally drawn to puzzles, challenges, and gadgets, I have been exploring the use of various means of bringing technology into my classroom since the early 90s. However, it was not until I was given the opportunity to focus on what was possible through an eight day web camp did my natural bent explode and open my imagination into new creative ways to teach economics. I can no longer imagine teaching without the use of what is possible through the use of the web. I am hooked, and delighted to be for this experience has rejuvenated my imagination and my interest in leading students into the exciting world of economics. The dismal science no longer needs to be confined to pure theory or to heavy textbooks. The theoretical content remains and must be learned, but through the use of the web I have found the means to bring students to the marketplace of today and the marketplace to them in the classroom.

However, although the benefits are many, the costs are many also. Some of the learnings I have experienced from the use of the web in teaching were unexpected and a shock when I encountered them. Others have been pure delight and resulted in a burst of enthusiasm and energy in my teaching. Although I am sure many who will read these revelations will recognize them as part of their own experience, other readers may be about to embark on a journey into the world of the web and computer technology in their teaching and will appreciate the insights as cautions to take into their journey. Regardless I offer them as a summary of my experience traveling into this new era of the 21st century of new and ever growing technological tools in the classroom.

The first and deliciously surprising discovery was my own enthusiasm for the new possibilities of presenting content. The web was there, growing exponentially and waiting to be explored. I had been exploring it for some time but did not have a window through which I could bring it into the classroom. Web camp gave me that window and set my imagination free to develop new ways to learn and teach. The realization of the possibilities gave me a high.

The second learning was this new creation was going to take time. Now that I had learned some new skills, I wanted to use them. My ideas grew faster than the time I had available to develop the ideas. The learning

curve of mastering these new skills was steep and suddenly I found I needed more time than I had to implement them. Web camp gave me a survey taste of the possibilities and a survey experience, but as the semester began, I realized I did not remember all of the details of how to do x and y. What saved me from spending excessive fruitless time deepening my knowledge and accomplishing my goals was the ongoing availability of the web camp instructor throughout that first semester. Consequently, the time I did spend learning and relearning how to grow my web was spent efficiently and effectively.

Third, my objective in using the web was to teach and not to distract. I found worthwhile content and worthless content on economics on the web. If I was going to ask my students to spend time using the web in the learning of economics, I wanted them to experience the learning as fruitful and not frustrating or meaningless. I spent hours searching for just the right site or the right information to enhance the objectives of the class before offering the content to the students. The web was to enable them to broaden their understanding of economics and not lead them astray from it.

Fourth, the web opened up the classroom into more efficient teaching and learning experiences. As one example, I used the discussion forum as a job market to enable students to experience a tight labor market as I was teaching about unemployment. The students in the classroom were divided into employers who had job openings and potential employees searching for jobs. Job openings were numerous. Potential employees were relatively scarce. Points were awarded for the achievement of filling the jobs or finding a job. Students learned how to use the discussion forum as well as a bit about the difficulty of finding the right fit between jobs and skills in a booming economy.

Finally, and this is probably the most basic learning I could share. If any of the above is to be achieved, it is absolutely necessary to have ongoing competent technical support. Technical support employees are always growing in their own skills and knowledge. They become known as "good" and are often pulled away into more challenging jobs. The new replacement staff may be at the bottom of their own learning curve in being support to an eager faculty. The impact on the faculty can be immense and often unrecognized by the technical support staff. Needless to say, it can be very frustrating and wasteful of precious time when unexpectedly the software which an instructor has become dependent on using is no longer available in the local network.

Any change in the technology used by the faculty on the part of the support staff needs to be done carefully and communicated thoroughly before changes are actually made. And even more important, any proposed change needs to be thoroughly tested and debugged before proposed as possible changes. Faculty ought not to be asked to spend their time to test new programs unless they knowingly and willingly engage in such activities. And the middle of a semester is not the time to make major changes in the technological base used by faculty.

Regardless of the unforeseen headaches one may encounter in using the web in the classroom, the benefits far outweigh the costs. I would wholeheartedly encourage any instructor to explore the possibilities of using the web in the classroom. However, I would also forewarn them that they will be treading new territory and should not be surprised by the problems they will encounter as they and their students grow into a new age.

Bruce A. Svingen (Chemistry)

The Web as a Positive Force in Biochemical Education

In biochemistry one of the most difficult subject areas for undergraduates is to master the structure-function relationships for large molecules of biochemical significance. Structure-function relationships are a key tenant of chemistry. "If you know what atoms makeup a molecule and how they are arranged you understand the physical and chemical properties of that molecule." The teaching of structure-function relationships begins early in first year chemistry where concepts for model building are introduced. Every

first year student learns the basics of valence shell electron-pair repulsion (VSEPR) model building along with the basics of chemical bonding. Students build simple models with ball and stick or space filling model kits. The ability to build and manipulate models is key to the students developing an understanding of structure and chemical reactivity.

When students move on to sophomore organic chemistry they once again find that structure-function is at the heart of understanding organic chemistry and again the building of models is key to their learning about functional groups, isomerism and bonding. In the era of computer labs and laptop computers the traditional ball and stick model kits are being rapidly replaced by modeling software packages of varying degrees of sophistication. (There are many modeling software packages that are available at Winona State University. We have been pleased with our experiences using a software package called HyperChem.)

Even with the availability of such modeling software, we still encourage the students to build ball and stick models when structural questions need clarification. First because the molecules being studied are a size and complexity amenable to model building, molecular weights of ~ 200 or less and total atom numbers of 30 or less, and second because for many students one just can't replace that experience of touching and manipulating a physical representation of a molecule.

The benefits of the model building the students learn in their first two years is irreplaceable, but when the students enter biochemistry such methods are no longer sufficient for the study of large biomolecules such as proteins and nucleic acids or large molecular assemblies such as phospholipid bilayer membranes. These molecules may have molecular weights ranging above 200,000 and more than 5,000 atoms. Even if they could build models by methods familiar to them they would not be amenable to manipulation and the threat of physical injury to the student would be real.

We wanted to address this problem of model building for biochemically relevant macromolecules via the World Wide Web. With our web page we wanted to give our students the tools and opportunity to explore macromolecular structures interactively. Our hope was that our web page would enhance their learning opportunities in the area of structure-function relationships for these large molecules.

Our first goal was to give students the tools needed for their explorations into the structure-function relationships of biochemical macromolecules. As judged by our students, and by us, there are several software that packages have proven very useful for the study macromolecular structures of biochemical significance. These programs are available free and can be downloaded from the Internet. Additionally the structural databases that these programs use are also available for no charge over the Internet. The first program we have used extensively is RasMol (Raster Molecules). It was written by Roger Sayle and is available from several sites on the web. (RasMol version 2.7.1 is available for download from http://iucr.sdsc.edu/iucr-top/cif/software/rasmol/).

RasMol translates a structure file in pdb (Protein Data Bank) format from the x-, y-, z-, coordinate of each atom based on x-ray crystallography or nuclear magnetic resonance studies, into a 3-dimensional structure that can be manipulated. The program is available for Windows, MacOS and UNIX platforms. pdb files can be found at several web sites including the Research Collaboratory for Structural Bioinformatics (RCSB) at Rutgers University (http://www.rcsb.org/pdb/). RasMol lets one display pdb files in a number of formats including wireframe, spacefilling and ribbons. RasMol also lets one select specific parts of a molecule to highlight for display via its command line editor.

For classroom use one can also compose RasMol scripts which will display the molecule in a desired view without having to go though the individual command line instructions needed to achieve the desired view. A limiting factor is that RasMol 2.7.1 cannot be used to edit pdb files. The ability to edit pdb files would give our students the opportunity to build their own structures and to combine files to allow the direct comparison of structures. This need for a pdb file editor was filled by the Swiss-pdb viewer, which is available for download from Glaxo Wellcome Experimental research. Although the Swiss-pdb viewer is a strong editor it is restricted to wireframe views. Another version of Rasmol, which can manipulate multiple molecules, is available from the Modular Chemistry Consortium project at the University of California

Berkley (http://mc2.cchem.berkeley.edu/Rasmol/v2.6/). Our class page brought together the links for programs and databases, the tools our students needed.

To introduce our students to the power and usefulness of the modeling of macromolecular structures we incorporated their use into our lectures. To "whet their appetite" we liberally used these programs and databases for the preparation of lecture slides and demonstrations. Slides from lecture were added to our class homepages for students to use. In addition we hyperlinked to the "raw" pdb files so that the students could start their own interactive exploration of the structures outside of the formal classroom. We firmly believed that through the students' exploration of the structures the real learning of structure-function relationships would takes place.

While we cannot demonstrate the interactive opportunities offered by our web in these pages we can perhaps give you a feeling for what the students experience by graphically examining insulin, a relatively simple protein. Insulin is composed of 51 amino acids, 460 atoms, in two peptide chains. Figure 1 is a wireframe representation of insulin.

Although difficult to see because of size restrictions from this structure students can see structural details such as the identity of the individual amino acids and their position in the structure, the placement of disulfide bonds and postranslational modifications. Figure 2 is a ribbon representation of insulin.

Figure 2 shows the broader relationships between the two chains and the nature of peptide secondary structure. Figure 3 is a space filling representation.

In figure 3 the nonpolar amino acids have been displayed in yellow and the polar amino acids in blue. This representation of insulin clearly demonstrates that the nonpolar amino acids are predominantly found in the interior of the molecule as would be consistent with the hydrophobic effect that dominates protein structural conformation.

These are static representations but they give one a clear understanding of the power of modeling software in understanding macromolecular structure. Add to this the dynamic exploration abilities the students have by investigating the structure with any of the three pdb viewers and one can appreciate the usefulness of modeling to the student's learning process.

Along with the links to software and databases and the encouragement to explore on their own from lecture, the rudimentaries of command line editing for RasMol 2.7.1 and the more powerful editing abilities of the Swiss-pdb viewer were addressed in help sessions and tutorials.

How well did it work? We believe it was a rousing success on many fronts. First, judging by the number of students that were involved with informal help sessions on RasMol it was successful at engaging the students in the study of protein structures. Second, based on the number of pdb files and file links that the students submitted to add to the web page it was certainly successful and they enjoyed their studies. Third, in student evaluations of those that had laptop computers and were part of the university's laptop initiative t it was useful. And finally, student performance on exam questions dealing with macromolecular structure increased noticeably across the board. This last point is of course what we as teachers are most interested but we feel it wouldn't have been possible if the students had not had the opportunities provided by having access to the positive force of web resources.

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